MINING & PETROLEUM STANDARD

AND

American Gas-Light Journal.

Publishing Office No. 22 Pine Street, opposite the Sub-Treasury Building.

VOL. VII.—No. 21—WHOLE No. 153. NEW YORK, WEDNESDAY, MAY 2, 1866. $3 PER ANNUM—IN ADVANCE.

PETROLEUM.

The Development of Petroleum as a Science.

One of the principal improvements as well as one of the most economical moves recently made, is that of appropriating the gas, which is produced in a greater or less quantity from all petroleum wells, for the purposes of fuel. It is obvious that like daylight, gas is only useful for immediate application, and cannot be husbanded for future use. The expense is trivial, and the method of using it very simple. Along the entire course of Oil Creek, the gas from the wells supplies the most of the fuel required and in some instances a great deal more than can be burned. The Egbert Farm in the vicinity of Petroleum Centre, and the Economite Wells at Tidiute, are two principal points where the benefits of this application are most extensive and apparent. On the Egbert Farm all the wells produce more or less gas, and one well in particular, which is owned entirely by the land interest, and flows about fifty barrels of oil per day, yields besides an immense flow of gas. The tubing which contains both the oil and gas is carried into a closely covered tank. The gas here naturally rises to the top. A small tank about the size of a molasses hogshead has been erected upon the top of the other and connected so as to admit of the escape of the gas into it. From the small tank a large feeding pipe conveys the current of gas through the vicinity of most of the wells and other places where it may be required. From the main pipe smaller feeders are carried to the furnaces of the engines, the corners of the streets, the parlors, kitchen and office stoves, the halls, the drawing-rooms, gardens, and in fact to every conceivable place where either light or heat is required. The burners used in the houses and offices are similar to those with which the manufactured gas is burned in cities, while in the engine houses and other places where more light is required, a small tube is merely flattened, so as to form a wider surface, or in many cases a piece of pipe is bent into a circle, or any shape that may be dictated by taste or suggested by ingenuity. Small orifices are made in it from which tiny flames present a fantastic and often beautiful appearance. The gas produced by this one well is sufficient to abundantly supply 15 engines, besides lighting the engine houses and warming and lighting the derricks when required. Twenty-four stoves are heated from the same source, besides what is consumed in lighting the contiguous houses and offices, yet the gas is not exhausted, and a large quantity is permitted to escape, as there is no use for it. Exclusive of the advantages and ornamental beauty of lighting the streets and houses from this well, the real amount of expenditure which it saves is very great. Not less than from twelve to fifteen dollars per day at Petroleum Centre are required to furnish an engine with fuel alone. In the case of fifteen engines this sum amounts to nearly or quite two hundred dollars a day, besides which the fuel is superior to all other kinds. It is perfectly clean and generates neither smoke nor soot. No trouble is necessary to light a fire beyond "turning a little gas," touching it with a lighted match and then regulating its size to the required heat. The pressure of the steam produced in this manner is much more regular and the consequent strain upon the machinery much less than when wood is used, and the intensity of the heat varied at each successive "firing up."—*Reno Times.*

Oil Indications at Lake Superior.

Professor Winchell, of Michigan, says in a letter:

"The Lake Superior sandstone occupies a lower geological horizon than any formation which has hitherto afforded petroleum in productive amounts, though nearly all transformations have been known to afford it in quantities large or small. I am not prepared, however, to express a theoretical opinion entirely adverse to the prospect of success, even in the Lake Superior sandstone. Oil was first obtained in large amounts in the Chemung and Portage sandstones of Pennsylvania—next in the older Hamilton group of Canada—then at the bottom of the coal measures in Western Virginia and Ohio, and lastly in the lower silureans in Kentucky and Tennessee. There can be no theoretical reason why it should not occur a little lower still at Lake Superior. If the surface indications are such as you state, I incline to the opinion that there are reasons for cautious explorations for oil. In your district are some dark bituminous shales, which, if underlying the porous sandstone, sustain the same relation to the oil-containing rocks as the black shales of Pennsylvania, Kentucky and Tennessee, and I should not be at all surprised if oil should be obtained there by you.

Nevertheless, it must not be forgotten, that the geological conditions are somewhat different from those of any known oil region, and expectation should not be permitted to run high."

UTAH COAL OIL.—The Vedette says: "We understand a number of gentlemen, residents of this city and Fort Bridger, contemplate erecting machinery on their coal oil spring this summer, and have already sent east for their machinery. The spring is located in Pioneer Hollow about 30 miles this side of Fort Bridger, and is reputed to run ten barrels a day—some say more. Would it not be well for our merchants to bring large numbers of coal oil lamps, of a cheap quality, from the east this year? If plenty of lamps were in the market we are satisfied everybody would use coal oil, for the company say they can sell the article for two dollars a gallon in this market.

LOUISIANA.—Louisiana puts in her claim to possessing oil territory. An owner of land near New Iberia was offered by some explorer $200,000 for a locality ascertained to yield Petroleum. He declined, but accepted $20,000 for one year's privilege of working his petroleum reservoir, with an interest in the profits. The Planters' Banner, too, announces the discovery of an abundance of petroleum about twelve miles from Lake Charles, in Calcasieu parish.

OIL IN NOTTAWASGA.—The Toronto papers are informed that oil has been struck in the township of Nottawasaga, near the village of Staynor, on the Northern railway, at a depth of 90 feet. The strata of rock passed through being shale and soapstone. Parties who are good judges in such matters, state that a large quantity of oil will, in all probability be found there.

MINING.

Geological Features of the Interior Plateau—The Reese River Region.

We give below a condensed statement of an extended report by Mr. J. E. Clayton on the peculiar geological features of the great interior plateau of the continent. It will be found particularly interesting as explaining the causes of the "system of faults" apparent in the metal-bearing veins of the Reese river region. The report will repay perusal, and will shed light in dark places. The geological formations of the country rock of the region comprise a very wide range between the azoic age and the teotiary period. In a geological sense the country is unexplored, and the ordinary rules of classification adopted by geologists, and applied to other portions of the continent, seem to be inapplicable to the region of country lying between the Sierra Nevada and the Rocky Mountains. It presents features altogether peculiar and *sui generis*. This great elevated plateau has been subjected to foldings, fractures, contortions, and revolutions, of a grand and comprehensive character; while the distu bances on the Atlantic side are generally only slight elevations and subsidences of the general level, upon which were spread by the hand of Time the broad tablets of geological science. This interior plateau has been apparently the area of greatest volcanic activity on the North American continent, and a very large proportion of the mountain ranges is composed of or covered by lavas and other igneous rocks. In every direction we find volcanic ridges, craters and lava beds, which have broken and scarred the original bedding of the secondary rocks. In addition to the mechanical changes in the original beds of the stratified rocks, we must take into consideration the chemical changes produced by the proximity of the heated rocks of the earth's centre The heated vapors and waters issuing through the fissures caused by the forces which produced the breaks and folds in the earth's crust, subjected some portions to greater metamorphic action than others more remote from the line of active disturbance and thus sedimentary rocks have been transformed to crystalline. By this agency the older sandstones have been changed to quartzite, and the calcareous beds into limestone and marble. From similar causes many rocks, originally fossiliferous, show no traces of them now, except in occasional remote spots. The general strike of the stratified rocks is N. N. W. and S. S. E., and very rarely conforms to the strike of the mountain ranges, but crosses them obliquely. Hence in travelling along any of the leading ranges we find the whole series of rocks common to the country singularly out of place, and lying in broken and detached masses like fields of broken ice. The igneous rocks of the volcanic period have filled the space between the broken masses. This fact will explain the absence of continuous metal-bearing rocks in this portion of the country. The mines lie in isolated sections, like islands in the ocean, and are scattered promiscuously. The country rock of the Reese river district is a stratifitd granite or gneiss, having a strike southeast and northwest, and a dip to the northeast of about sixty degrees, and large proportion of the metal-bearing veins have a similar strike and dip. South of the Reese river district we find a great variety

of slates, limestone, calcareous sandstone, scienite, green stone, porphyry, trachite, lava, &c. Massive unstratified granite has not been found in this portion of the State. The veins are generally clustered and in belts, having a course nearly parallel with each other, and carrying the same class of ores. At those points where the different groups or belts intersect or blend, the country rock is fissured and broken in every direction, and filled with small veins or seams of quartz forming a complicated net work, which renders the tracing of the leading veins a difficult task. This perplexing condition, however, occurs at only a few points, each group of veins being generally parallel and exhibiting rare intersections or croppings. In addition to the great number of quartz veins which ramify this district, there are numerous trap dykes or veins that cut through the granite nearly north and south, and stand in a vertical position and parallel with the central axis of the mountains. The dykes are from two to fifty feet thick, and are evidently older than the metalliferous veins, and are cut by them in most instances where they come in contant. There is still another set of fissure lines, having a course nearly parallel with the mountain range and a dip to the west of about forty degrees. Upon these lines occur nearly all the faults met with in the district, and as the fissures are generally filled with clay they are called "clay seams." The soft friable character of the country rock, the large amount of argillaceous and talcose matter contained in it, and the inclined plane of the last mentioned fissures, have facilitated the movement of the outer portion of the mountain sides toward the valley, and caused the oblique "faults" or "slips" across nearly all or quite all the veins in the district. These faults are sometimes very troublesome and annoying to the miner, who is unacquainted with the causes of the breaks and the direction of the movement.—*Reese River Reveille, March 6.*

The Supply of Iodine and Bromine.

Iodine occurs in commerce much more abundantly than bromine, and hence does not command so high a price as the latter element, the present commercial value of bromine being, weight for weight, nearly double that of iodine. The greater portion of the bromine of commerce is obtained from the mineral springs of Theodorshall, near Kreuznach, in Prussia; that of the iodine of commerce from the mother liquors of "varek," or kelp, being the liquors which are left after the complex solution obtained by lixiviating the ashes of seaweed has been freed as far as possible, by careful evaporation and cooling from the chloride of potasium, chloride of sodium, carbonate of sodium and sulphate of sodium, which are the salts most abundantly contained in them. These mother liquors also contain bromine, though in much smaller quantity than iodine, a ton of seaweed yielding about a quarter of a pound of iodine, but not more than half an ounce of bromine. Both the bromine and the iodine contained in seaweeds are of course derived from the ocean, and the curious thing is, that whereas sea weeds contain about eight parts of iodine to one of bromine, sea water seems to contain a much larger proportion of bromine than of iodine. The water of the Dead Sea has long been known to be exceedingly rich in bromine, without containing, so far as could be ascertained by the old methods of analysis, the least trace of iodine; and now Mitscherlisch has not only failed to detect, by the delicate process of spectrum analysis described above, the minutest portion of iodine in the water of the Dead Sea, which might well be conceived to be exceptional in this respect as is many others, but he has also failed to detect the iodine in European sea water containing a very appreciable quantity of bromine. For example, he found that the residue from the evaporation of six and a half pounds of sea water taken off Heligoland, treated by his process, showed the bromide of copper spectrum for seven minutes, but did not give the least sign of the iodine spectrum. There would thus seem reason to believe that bromine is more abundant in nature than iodine; if so, we may be sure that it will one day be more abundant in commerce, too.

Gold Mines in New England—Rich Discoveries in New Hampshire—A Hartford Company Strike Gold.

Much interest and excitement has existed among the good people of Upper New Hampshire, and in parts of Vermont, in consequence of rich discoveries of gold in the quartz of the mountains there. A New York company has found such positive proofs of a large gold vein in one of the spurs of the Green Mountains in Vermont, that they are now erecting the necessary quartz crushing machinery and are going to work. A Hartford company seem to have struck an equally rich, or richer mine. It is in the Franconia Mouniains of New Hampshire, and in the town of Lisbon. Specimen of the New Hampshire, and in the town of Lisbon. Specimens of the quartz thrown out by a blast, and picked up "just as they came," without selection, were taken to Professor Hayes, the State Assayer of Massachusetts, for analysis.

His report would indicate a richer gold mine in New Hampshire than anything ever known to California. He pronounced the quartz to be worth $807 a ton for its gold, and $159 for its silver. This was in Januury. Another test just made, of fragments blasted lower down, confirms the above value of the white quartz, in bits the size of a mustard seed to that of half a pea, and make certain specimens of grey quartz, in which no gold is visible, worth much more; as high, according to one batch of samples, as $1,500 a ton. He declares it to be the richest quartz he ever assayed, not excepting the best from California or Nevada.

Right in Lisbon village this company have obtained and opened a rocky peak which is apparently all full of plumbago, mixed with silver. It is a beautiful specimen of plumbago, yielding, by assay, $28 in plumbago and $20 of silver.

The geological formation of the gold mine presents the peculiar perpendicular clearage called the "Wall," revealed by blasting, which experienced California miners delight to behold as one of the very surest signs of rich deposits.

Of course such discoveries have fanned the "gold fever" of the people there to a high pitch, and speculation is rife. The company we have spoken of, made up of Hartford and Springfield men, are organized with a capital of 200,000, have leased 600 acres for 100 years, besides other tracts in which copper is found, and are about to put up machinery. The gold developments are confidently regarded as uncommonly rich. The gold shows no tendency to diminish, while the lead and silver seem to be less promising as to quantity. If the deeper mining confirms the revelations already obtained by blasting to a depth of fifteen feet, the Lisbon mine will become more famous than the California "Gould & Curry."—*Hartford Times.*

Statistics are tyrannical and mysterious. It is hard to believe that the Ganges bears down hourly a mass of deposit, equal to so many Egyptian pyramids; and we are staggered by the information that a penny put out to compound interest in the time of Adam, would be now worth many hundred globes of solid gold, each equal in size to the earth. We are now called upon to accept the stupendous fact discovered by some curious Englishman, that 4,000,000 sermons are annually delivered in London. Deducting a liberal patronage for good sermons, by men of talent and cultivation, we have left 3,960,000 aggregations of phrases, which an incredible number of hearers devour with every sensation but admiration.—*Am. Ex. and Review.*

An engineer of Toulon has invented a plan for keeping the water in the harbors of the Mediterranean, which is in a perpetual state of stagnation in consequence of the absence of tides, constantly renewed by an ingenious mechanical apparatus. The naval prefect of Toulon, who distinguished himself so much while the cholera was prevalent in that town, is about to test this invention. If the trials prove successful the discovery will be most valuable from a sanitary point of view, as the unhealthiness of many of the ports is chiefly caused by the stagnant water.

WATER.

Paris Water Supply.

M. Riche dellvered at the Sorbonne recently a lecture upon the water-supply of Paris, of which the following is a summary:

The superiority of spring water over river water was long known to the ancient inhabitants of Lutecia, and the Arcueil waters were very much prized; yet it was not till the thirteenth century that we find a religious corporation proprietors of a spring at Bellevllle, near Saint-Gervais-des-Pres, which, by means of an aqueduct, supplied a fountain yielding 35,200 gallons per 24 hours. In 1855, Paris received 44,000 gallons per day, or, as the population was 200,000, less than 1¼ pint per inhabitant! Henry IV. abolished many privileges and monopolies tending to limit the water-supply, and installed the first pump, called *Samaritan*, at the Pont Neuf. In 1613, he set about reconstructing the celebrated aqueduct of Arcueil; but this great project was only put into execution by Marie de Medicis. But under Louis XIII. and Louis XIV., concessions awarded to favoritism caused such a dearth of water that a second pump, called that of Notre Dame, was set up in 1671, and remained till a few years ago. By this means Paris received 396,000 gallons per day, or 2·6 quarts per inhabitant. In 1777, the Perier Company constructed the Chaillot pumping engines, which raised water at the very outfall of the sewers, and in 1782 the state purchased and improved the plant of the company, increasing the water-supply to 1,760,800 gallons per day, giving 12·3 quarts per head of the population. This was still a very deficient supply. In 1797, the project of the Ourcq canal was set on foot; the works of this supply from the Marne were begun in 1801, and completed by Girard in 1822. The supply branch commences at Mareuil, and arrives at La Villete by an open canal 100 kilometres long. These waters have three outlets, one ending at Monceaux by means of the "aqueduc de ceinture," another leading into the Saint-Denis canal, and a third into the Saint Martin canal. To this quantity must be added the supply from eighteen steam engines, from the artesian wells of Grenelle and Passy, to have a sum total of the supply of Paris about six months ago. The 42,919,500 gallons which were then supplied to Paris every twenty-four hours were thus divided: 23,110,500 gallons from the Ourcq canal, 17,608,000 gallons from the Seine, and 3,201,000 gallons from Arcuiel, the artesian wells, and Belleville springs, or 25·3 gallons per inhabitant.

This mass of water is still insufficient; and, really, when we consider that the Bois de Boulogne and de Vincennes absorb on Sundays 7,708,500 gallons; the fountains and sewers 5,500,000; the bones-fontaines (only running for three hours daily) about 19,800,000; and private service about 17,600,000 gallons; we can easily comprehend how the supplies were completely exhausted last summer.

The Ourcq canal had been constructed for a two-fold purpose; it is traversed by 600 boats, manned by 1,600 men; it runs through 100 kilometres of country to empty itself in a basin situated so that to interrupt the service would deprive Paris of the water for a month. Its water is muddy and selenitic. The Seine water raised at Chaillot, which furnished in 1857 the 5-6ths of the public supply, contains organic matters which, according to M. Dumas in his report to the Municipal Council, sometimes attain incredible proportions. Thus, after the dry season of 1858, there passed under the Pont Royal a metre cube of sewage in 44 of water per second (a metre cube = 220 gallons). Thus the Chaillot pumps supplied 2·3 per cent. of organic matter to the inhabitants.

At length, after a protracted examination and the analysis of 300 springs, the project of Mr. Belgrand, engineer in chief the water of the town of Paris was adopted. The two sources fixed upon were both in the champagne district—that of the Dhuys, rising between Chateau-Thierry and Chalons; and that of the Vanne between Troyes and Sens. The former yields 8,800,000 gallons per day, and the latter about 22,000,000 gal-

lons. Their volumes had not sensibly diminished during the dry seasons of 1857, 1858, and 1859, and the waters contain no sulphate of lime; the carbonate of lime they hold is less than that in the Seine water. The Dhuys arrives in the highest quarters of Paris, where it is allowed to fall through a cascade, which causes it to deposit its excess of carbonate of lime. It starts with two canals, a kilometre long each, which are united into one; it follows the left bank of the Marne as far as Chalifert; there it crosses the river, and keeps the right bank as far as Belleville, which it reaches after a run of 140 kilometres. At the Menilmontant hill the Dhuys is at an altitude of 354 feet, while the Ourcq basin has only 171 feet. The reservoirs we have already described contain 230,100,000 gallons, and are arched and covered over with a thick layer of earth. The reservoir for the Vanne water, at Menilmontant, will be 262 feet in elevation. When this is completed, Paris will have a daily supply of 30,814,000 gallons of spring-water, or 18 gallons per inhabitant, solely for domestic use; adding to this the supply from the new turbine pumps at St. Maur, when completed, 100,145,500 gallons daily, or 58·77 gallons per inhabitant, will be supplied to the town of Paris in about three years hence.

Filtering Water.

Le Genie Industriel reports a new application of law of capillary attraction, by Mons. Aman Vigie, to the filteration of water on a large scale. His system is based on the ascentional power of water through porous bodies. By the law of capillarity water will penetrate a porous body to a certain height. If, when arrived at that point, it finds a siphon curve, it will follow that curve, and run off; and thus a regular and constant current may be obtained. The water, elevated slowly by capillary attraction, is freed from all impurities held in suspension, and in the same condition as if it had passed through a filter. Mons. Vigie had caused to be made for his experiments filters of terra cotta, very porous. This substance has the advantage of great durability; and it is inert, and cannot alter the water. The filters placed in mud worked for a long time without their pores being chocked: the part immersed in the mud working is effectively as the other parts.

GAS.

Unreasonable Prejudices against Gas Companies.

TERRE HAUTE, IND., April 12, 1866.

MESSRS. EDITORS:—

It seems surprising to those who are thoroughly acquainted with the operations of gas companies, their officers and employees, the instruments for measuring gas, &c., that there should be such an amount of prejudice against them in the community at large. Are not the stockholders, officers, engineers, superintendents, and employees of every variety and grand as honest and honorable men individually as those engaged in any other business or calling? Does it follow as a matter of necessity that men who, otherwise employed would be considered good and respectable—whose lives are irreproachable—whose moral characters are unimpeachable—who give evidence of ability and talent of a high order so as to cause them to become eminent in their peculiar profession, yet, forsooth, because connected with gas companies and their operations they are to be denounced as "unscrupulous monopolists," "swindlers," "robbers," &c., &c., and on some occasions almost insulted when pursuing their daily avocations? Not that they are charged with being guilty of fraud individually, but that the public seem to esteem it a natural consequence, incident to the business with which they are connected.

We think that these prejudices, at the present day, are entirely unfounded and unwarranted by the facts in the case. There should be a vast difference in public sentiment between the time when gas was first introduced into common use—when even men of eminence and scientific attainments were entirely in the dark as to the best means of storing it—and the present day, when science and experience have developed its intrinsic merits, its perfect harmlessness when properly secured, its universal usefulness not only as a source of light, but also for imparting heat, in its application to the warming of houses, for culinary purposes, and as a motor in the useful arts.

It is on record as late as 1814, only fifty-two years ago, that "Sir Joseph Banks, at the head of a deputation from the Royal Society, visited one of the gas works in London, and afterwards strongly recommended government to restrict companies from constructing gas-holders exceeding 6000 cubic feet, to be confined in very strong buildings;" while at the present time a gas-holder one hundred and sixty feet in diameter and ninety-five feet high, capable of holding 2,000,000 cubic feet of gas, is now in daily use in one of our cities

Then gas meters were small and an untried experiment, waiting for the sure test of experience; now they are frequently made twelve and fifteen feet in diameter, with immense cast iron cases, capable of passing and registering with perfect accuracy millions of cubic feet of gas per day.

What is the Gas Meter? An instrument for the measurement of gas; one of the most ingenious contrivances of the age; formed in accordance with well established scientific principles; simple in construction, exact in its operation. As with the steam engine when it left the hand of Watt, so with the wet gas meter—it came almost perfect from the hands of the original inventor, the elder Clegg, and on which very little decided improvement has since been made.

The dry meter subsequently invented, and as perfected at the present time in the Glover and De Frees' meters, especially the former, are almost entirely superseding the wet meter in this country for private consumers; not on account of any superiority over the wet meter as a gas measurer, for we believe all experienced gas men will admit, that the life of a wet, is longer than that of the dry meter, while they are both equal in point of accuracy of measurement; the preference being given to the latter, on account of their not requiring that constant attention from the company and consumer to keep the wet meter at the proper water line, and also because of their being less liable to be affected by the sudden changes of temperature of our variable climate—a difficulty, however, which is now being removed by the use of "Glycerine," "Gengenebre's fluid," and other non-evaporating and non-freezing compounds.

Reader, did you ever go into a meter factory? it would prove to you a well spent hour, if you should—there you can see the meter in every stage of its growth—from the raw material, to the finished machine complete in all its parts. There are hundreds of intelligent mechanics, each in his own particular branch, which by the mere force of habit from the repetition of the operations, has made him almost perfect in the manipulation, each of his own work.

In the basement of the factory, you will find the raw material—the tin plate of every grade—the metal out of which the drums for wet meters are compounded, consisting of certain proportions of block tin, antimony, &c., to make them resist oxidation from their contact with the acidulated water—the block tin, copper, zinc, &c., out of which the castings are formed, subsequently appearing in the shape of solder, drum-metal, spirals, wheels, axles—worked up into dials—in fact into all the multitudious parts of the perfect meter.

Further on, you come to the powerful engine, performing its allotted work with steadiness and ease—rolling the metals—stamping the cases—turning the lathes, where all these separate parts are being perfected; in an upper room you see these lathes whirling with noiseless activity, while the tools in contact with the various metals, each in the hands of skillful artizans, or attached to machines which work with all the precision of mathematical accuracy—causing it to assume the required shape and form requisite for their perfect work—in other rooms the workmen are engaged in making the cases—adjusting with the nicest accuracy, the propeller-like compartments of the wet meter, selecting the perfect skins (African goat), for the bellows portion of the piston-like arrangement of the dry meter—dressing the valves and valve-seats of the same meter, and, not to be tedious, others arranging these separate parts, which have been so nicely fitted and prepared, each going into its own proper place, as if guided by some mechanical instinct, until at last it comes to the hands of him, who is to establish the correctness of its operations before the final event, which closes each in its own separate case and sends it on its mission of unceasing vigilance over the subtle fluid—which no longer a luxury, has now become, especially in large cities, one of the necessaries of life.

Let us look a little into this matter of testing the accuracy of the meter; notice the room prepared purposely for this particular work; see the thermometers of the air and water; examine the various guages, to regulate exactly the pressure under which the meters usually work; look at the "Meter Prover," its contents accurately calculated, as much so as a "standard United States measure," quart, pint, bushel, or any larger or smaller measure for public use—it containing a certain number of cubical feet, as is expressed in the laws governing such measurements—"that the cubic foot, containing sixty-two, and three hundred and thirty-one thousandths pounds avordupois weight of distilled rain water, weighed in air at a temperature of 62 Farenheit scale, the barometer being at 30". What could be more scientifically accurate!

Examine carefully the prover itself, it will bear inspection. See, when the operator raises the small stopper, how the air rushes in to fill the gasometer as he elevates it to its proper height; watch the thermometer attached to the top to certify to the temperature of the internal air, that it is precisely the same as indicated externally; when the stopper is replaced notice that beautiful contrivance the water seal (so essentially useful in every step of the manufacture of gas), as exhibited in this instrument, which retains that gasometer in its elevated position, not allowing a particle of air to escape; observe the scale at the left, divided precisely into ten equal parts—each of these ten subdivided into ten more accurately measured parts; look at the index attached to the top of the gasometer, and pointing directly to the 0 or zero mark of the scale; notice the operator attaching the meter power to the inlet side of the meter, while on the outlet he screws a union with a small hole in the top so graduated as to pass precisely the number of cubic feet per hour that the meter is designed for. Now with all intentness observe the gasometer gradually sink into the holder, while the meter is performing its operations, and if you perceive—or the operator, for it is his business and which he is sometimes sworn faithfully to execute as a duty, in accordance with some State law, that it does not vary more than two out of the one hundred tenths on the scale, it is marked correct, finished and sent to the companies who have purchased them.

Not only do the meters undergo this scrutinizing test by the manufacturer, but every gas company of a size that can afford to purchase a 5 feet power or larger, have each one of the "provers" upon their premises—not only to test their meters when received, for it is more their interest to have them correct than for the individual, for they would suffer more loss in the aggregate, but if any of their individual consumers doubt the accuracy of their meters, that they may be tested, to the satisfaction of all parties concerned. Some we are afraid there are, who can never be satisfied; for whatever evidence they may receive they are still of the opinion there is something absolutely wrong, which no scientific manipulation, however accurately performed, can ever make right.

We think it was the late distinguished philosopher the elder Silliman, of New Haven, than whom none stood higher in the scientific world in this country, who said, "that there is no article in daily use in life, more accurately measured, than is the illuminating gas furnished by Gas Light Companies, to their consumers."

If such is the case, and we conscientiously believe it is so, why is it that the complaints by private consumers are so unceasing, that they are constantly being defrauded, &c.

We have endeavored at the risk of being considered tedious, to show how at every step, skillful workmen, perfect machinery, and critical tests have been brought in requisition, in order to make a perfect machine. Now what a farce, to talk about the frauds practiced by the employees of the Gas Companies—these charges are simply ridiculous—in the cities these parties are frequently irresponsible and have no interest in the Gas Works and would as often be disposed to favor the individual, as the Gas Company. When Gas Companies, Mr. Editor, come to read your late editorial on "Gas Inspection," in your issue of April 2d, we are afraid they will say in the words of the Spanish proverb: "Save us from our friends, and we will take care of our enemies." You say, "If you (the consumer) are careless in this respect, the employee of the Gas Company, whose duty it is to take and report the meter will many times take advantake of your carelessness, and instead of performing his duty, spend the time it would require more to his own liking, and make his report correspond in amount with the one preceding, with perhaps slight variation more or less to avoid suspicion, and the bill is sent in, which you are necessitated to pay, because you neglect to summon the witness who stands ready to testify in your favor—your meter." Now suppose he did do so, would the consumer be defrauded? Of course not, if he continues using the gas—for the employee must at some time come back to the meter and take the statement from it, when anything of that nature would at once be corrected; for, are you not aware, that the meter goes on registering whether the employee takes it correctly or incorrectly—so that the *person who retains his meter in possession, cannot be defrauded;* he might be, if after such a course as pointed out by you, *the meter were removed.*

If at any time, any consumer is of the opinion he has been defrauded, let him take the meter himself, for the art can be acquired by any intelligent person in five minutes, or if he cannot or does not care to do it, let him get some one with whom he is acquainted, and on whom he *can rely* to do so—let him take the present statement, then get one of his old bills of a year previous or two, if he desires—and if he has not got it, go to the books of the Gas Company, they always retain the original bill, giving the consumer the duplicate—then deduct the old statement from the present, multiply that sum by the price, and if he pay meter rent or United States tax let them be added; then take the aggregate of his payments for the same period, if they agree the bills are correct, if they disagree there has been fraud, which can be easily traced on the books of the company and thus exposed.

It should be remembered, that the gas meter is always in the possession and under the control of the consumer; that it cannot in any manner be affected by the employee of the Gas Company, neither internally nor externally, except in the case of the wet meter, in which the water may be, but it very rarely kept at the maximum height, or by increasing the pressure at the works unduly.

By these means a slight difference might be made, but we do not think it would be profitable to them, inasmuch as it would require great attention on the part of the employees to the metres, and in the case of increase of pressure, cause considerable leaking in defective mains, more than the excess would render profitable.

Now, it is certain that consumers do complain, and with justice, that although they have the same number of burners that they had the previous year, that they are lighted and extinguished about the same time, yet their bills the last year, are larger than during the same period previously! This need not be at all surprising to any intelligent and thinking man; the burners, in a large majority of instances are composed of metals—iron, brass, &c., at the point of combustion great heat is generated, and that continued a longer or shorter period, a greater or less degree of oxidation resulting in exfoliation takes place, thus causing the holes to be stopped up and the metals to scale off; pins, and other means of removing obstructions are inserted and consequently the apertures for the emission of the gas are gradually increased in size, the gas passes off in broader, denser volume and not in the thin sheets of flame they were designed to pass, and consequently the consumer does not get even as good a light from a larger quantity of gas, as he did when his burners were new; again the cocks on the various fixtures become worn, the gas in passing cut out the brass, and these more or less leak. We frequently hear say, "Our fixtures leak, but it is so small that although we can detect it, we cannot make it ignite." These causes combined will in the course of one, two or three months, the time for which the gas bills may run, make quite an aggregate—only proving the extreme delicacy and accuracy of the meter whose operations are so frequently vilified.

Another real reason of bills being large, is, that consumers and their servants are careless—they leave lights burning in various unoccupied rooms without any necessity, instead of turning them down to a low point, and then increasing the quantity when needed; in midwinter they use the gas in the morning as well as at night, making from seven to ten hours' consumption a day, and then wonder at the size of their bills—curse the Gas Companies and their employees, and "howl horribly," when it is merely the result of their own extravagance.

G. R.

MISCELLANEOUS.

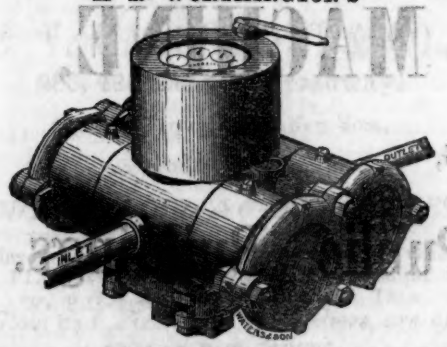
Manufacture of Peat Fuel.

At the Dublin meeting of the Institution of Mechanical Engineers, Mr. Charles Hodgson, of Portarlington, read an interesting paper upon his improved process of compressing peat, a description of which has already been published in the *Mining Journal*. In the discussion which followed, Mr. Hodgson stated that compressed peat was now delivered on the quay side, in Dublin, at 10s. per ton, and at houses for 11s. 6d. A very large quantity had already been sold in Dublin, but the works were not yet sufficiently extensive to turn out more than a limited make per week (say) about 180 tons. The peat was not capable of standing the blast in a blast-furnace, but it had been employed successfully for melting iron in reverberatory furnaces; it was used for that purpose at the Derrylea Works, and was found to stand very well in the rererberatory furnace with a fanblast. Mr. W. E. Newton said that various attempts at condensing the peat into solid fuel had been made, but although to those unacquainted with the nature of the substance its preparation might appear an easy task, it was practically one surrounded by a great many difficulties. He was glad to learn, however, that many of these difficulties had now been overcome, and hoped that further endeavors would be made to bring the peat into such a state that it might be profitably used in the manufacture of iron. Thus far the peat had only been compressed, which did not appear to be enough to render it applicable to the manufacture of iron; as for this purpose it required to be converted into the state of charcoal, so as to enable it to stand the blast. As regarded the manufacture of gas from peat, the principal difficulty arose from the fact of the peat containing so large a quantity of oxygen, in consequence of which the amount of carbonic acid gas generated by the distillation of the peat was too great to be easily eliminated from the carburetted hydrogen produced; and, therefore, the attempts hitherto made to obtain carburetted hydrogen gas from peat had been unsuccessful. He then proceeded to describe Mr. Buckland's process, observing that it was already being carried out at Mr. Danchell's ironwork's, at Horwich, in Lancashire, and also at Creevelea, to a sufficient extent to prove its utility; and he exhibited a piece of pig-iron produced at Creevelea, which he considered a very good sample of iron. It was made from iron ore found in that neighborhood, and smelted in the blast-furnace with peat manufactured according to this process and was called Irish charcoal iron.

The plan described by Mr. Newton was admitted by Mr. Hodgson to be ingenious, but open to much objection; for by taking the wet peat from the bottom of the bog, eight or nine tons of water had to be handled for every ton of peat afterwards made—this water must be evaporated by artificial means. In order to derive any profit from the manufacture, it would be necessary (assuming the wet peat from the bog to contain only eight tons of water per ton of peat), that one ton of peat should not only be capable of being economically applied to dry out seven tons of water, but that it should leave a sufficient surplus of fuel for sale, which was evidently altogether impracticable. In the manufacture of peat at Derrylea, the bog was first drained as much as possible, which would, of course, be done in any case, whatever process of manufacture were adopted. But instead of taking the wet peat from the bottom of the bog, a thin portion of the surface only was operated upon, which was always the driest; and by repeatedly harrowing this over, the peat was so far dried by the exposure to the air that it was obtained from the bog with only 1¼ ton of water per ton of peat, making only 2½ tons total weight to be handled, the rest of the water having to be evaporated out by the atmosphere, before any artificial drying was attempted. Until this advantage was gained of obtaining the peat dried to that extent by natural means, he did not think there was any use in attempting to dry the peat artificially; but when the peat was already brought by natural drying to such a state that it contained only 1½ ton of water per ton of peat, then it was practicable, with one ton of peat to expend, both to get rid of this remaining 1½ ton of water, and to have still a large proportion of the peat left for carrying on the manufacture and for sale. This was what had been found to be the case in the actual working of the system at Derrylea, and the plan there carried out was the only one at present, he believed, that had stood the test of actual commercial manufacture, the other process that had been referred to not having yet been carried so far as the actual manufacture of the peat for sale.

With regard to the manufacture of illuminating gas from peat, it appears that mixed with coal it gives some decided advantages. In reply to a question upon this point, Mr. Hodgson stated that they had put up a small gas apparatus at Derrylea, which was employed successfully for lighting the works. A mixture was used of two-thirds peat and one-third Cannel coal, and the gas produced from this mixture compared advantageously in illuminating power with the ordidary coal gas made in Dublin; while the quantity made exceeded, he believed, that obtained from coal alone. He had heard of the process that had been mentioned for increasing the illuminating power of gas obtained from wood, and hoped to try it shortly with peat; hitherto the main object had been to turn out a sufficient quantity of manufactured peat for commercial purposes, and having now succeeded in doing this, he hoped further to perfect the various uses to which the peat could be applied. Referring to the drying of the peat, he said he had tried drying it by blowing a current of hot air through it, but there were practical difficulties in the way of carrying out that plan, and the air blew away a great deal of the finer portion of the peat powder, causing a serious waste; and that mode of drying had not been found to answer so well as the exposure of the peat in a thin layer with a large extent of surface, as was now done in the drying chambers with the hollow floors heated by steam. He did not think it would be advisable to dispense with the scrapers now employed for scraping the peat along the floors of the drying chambers, because then the peat would not be stirred at all; and if carried upon an endless band, it would go forwards in the exact position in which it fell upon the band, and would not receive that continuous stirring which was so essential a feature of the present arrangement, exposing constantly a fresh surface to be dried by the heat. Mr. J. Whitley enquired whether any use had been made of the ashes after burning the peat? He thought they would be found very beneficial in smelting iron, by mixing them with the fuel in the blast-furnace. In reply to which Mr. Hodgson stated that he had kept the ashes made at the works from the peat, burnt in the furnaces, thinking they might, perhaps, be sold at a low price for agricultural purposes, but he had not supposed that any application could be made of them in connection with the smelting of iron.—*London Mining Journal.*

H. R. WORTHINGTON'S



PATENT WATER-METER

This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY

with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. — These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

CHASE & CO.,

New York and Philadelphia Ornamental Iron Works.

GARDEN ADORNMENTS,

VASES, FOUNTAINS, STATUARY, ARBORS, RUSTIC CHAIRS, SETTEES, TRELLISSES, &c.

Cem tery Embellishments,

URNS, IVY CROSSES, GRAVE BORDERS, WIRE ARCHES, BOQUET VASES, &c.

Wire, Cast Iron and Bronze Railings,

For enclosing Lots, Public Squares, &c.

☞ *Iron Furniture, Bedsteads, &c., &c.,*

The largest variety in the United States.

STABLE FIXTURES,

RACKS, MANGERS, &c.

No. 524 Broadway, New York,

Opposite St. Nicholas Hotel. [127

H. P. GENGEMBRE'S

PATENT

Non Freezing and Non Evaporating

METER FLUID,

☞ Far cheaper than any other in use. ☜

For Filling Wet Gas Meters, cheaper, in the long run, than water.

Six years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend the patent with perfect confidence.

For information and purchase of rights, apply to
A. DOISEY, Esq., Sole Agent,
Box 2,180, Cincinnati, Ohio, or to
H. P. GENGEMBRE, Pittsburgh, Pa.

The privilege of using the Patent has been granted in the following cities.

Allegheny City, Pa.; Leavenworth, Kansas; St. Louis, Mo.; Chillicothe, O.; New York, N. Y.; Washington, Pa.; Greenbush, N. Y.; Ottawa, N. Y.; Detroit, Mich.; Hannibal, Mich.; Linn, Mass.; Lansinburg, N. Y.; Rock Island, Ill.; Burlington, Iowa; Mount Vernon, O.; Troy, N. Y.; Galena, Ill. Pittsburgh, Pa.; Ithica, N. Y.; Akron, O.; New Castle, Pa.; Portsmouth, O; Brooklyn, N. Y.; Mansfield, O.; Steubenville, O.; Fort Wayne, Ind.; Peoria, Ill.; Wooster, O.; Bellefonte, Pa.; Kalamazoo, Mich.; Seneca Falls, N. Y.; Birmingham, Pa.; Saratoga Springs, N. Y.; Salem, O.; Dubuque, Iowa; Newark, O.; Wheeling, Va.; Jersey City, N.J. Quincy, Ill. Piqua, O.; and others. [141

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

NEW YORK.

CENTRAL OF NEW JERSEY.

Leave from pier No. 15 North River, (Liberty Street,) daily at 6 a. m. for Easton, Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, &c. Mail train at 8 a. m. for Flemington, Epston, Water Gap, Scranton, Wilkesbarre, Great Bend, Pittston, Binghampton, &c., 9 a. m. Western Express for Easton, Allentown, Harrisburgh, Pittsburgh, and the West, with but one change of cars to Cincinnati or Chicago, and but two changes to St. Louis. 12 m. for Easton, Allentown, Mauch Chunk, Reading, Pottsville, Harrisburgh, &c. 4 p. m. for Easton, Scranton, Great Bend, Bethlehem, and Mauch Chunk. 5 p. m. for Somerville and Flemington. 6 p. m. Express Train for the Oil Region and Erie, via Mauch Chunk and Williamsport, daily, except Saturdays. 6:30 p. m. for Somerville. 7 p. m. for Somerville. 8 p. m. Western Express for Easton, Allentown, Reading, Harrisburg, Pittsburg, and the West. Sleeping cars through from Jersey City to Pittsburg every evening.

ERIE RAILROAD.

Trains leave New York, from the foot of Chambers Street, N. R., via the Pavonia Ferry, at 7 a. m., for Buffalo, Canandaigua, Rochester and principal stations, and also for Cleveland, via the Atlantic & Great Western R. R. For Otisville and way stations (milk train, daily) at 8:30 a. m. Mail train for Buffalo and intermediate stations, 10 a. m. For Port Jervis, Newburgh, Warwic, and intermediate stations, 4 p. m. Night Express, for Dunkirk, Buffalo and principal stations, 5 p. m. Night Express, 6 p. m., daily for Dunkirk, Canandaigua Rochester and principal stations, and for Cleveland, via the Atlantic & Great Western R. R. Emigrant train for Dunkirk and Buffalo, 8 p. m. Freight Express, daily, for Dunkirk, 10 30 p. m. Trains leave for Patterson (daily), at 6·45, 7, 8·30, 9·15, 10 and 11·45 a. m.; 1·45, 3·45, 4, 4·30, 5, 5·30, 6·15, 8, and 10 30, (both daily) p. m. The word "daily" indicates that it runs Sunday,

NEW JERSEY, (via PHILADELPHIA. BALTIMORE AND WASHINGTON.

DEPOT FOOT OF CORTLANDT ST.

Trains for Philadelphia only leave New York at 7 and 10,00 a. m.; 12, 4, and 6 p. m. and 12 Midnight.

For Baltimore, 8 and 10.00 a. m. and 6, 7, p. m. and 12 Midnight.

For Washington, 8, and 10,00 a. m. and 6, 7 p. m. and 12 Midnight—Through ticket sold and baggage checked for the West, on 7 a. m. and 6 p. m. trains.

For Newark, 6, 6.30, 7.30, 8.10, 9, 10, 11, and 11.40 a. m., 12 m, 1, 2, 3.20, 3.40, 4.10, 4.30, 5, 5.10, 5.20, 5.40, 6.10, 7, 8.20, 10, and 12 p. m.

For Elizabeth, 6, 7, 8.10, and 10 a. m.; 1, 2, 3.20, 3.40, 4.10, 4.30, 5, 5.10, 5.40, 6.10, 7.10, 8 20, 10 and 12 p. m.

For Rahway, 7, and 10 a. m. and 12, 2, 3.20, 4.10, 5.10, 5.40, 7.10, and 12 p. m.

For New Brunswick, 7, 8, 10, and 11.30 a. m.; 12 m. 4, 4.10, 5.10, 6, and 12 p. m.

For Millstone, at 8 a. m.; 2.15, and 4.10 p. m.

On Sundays trains leave New York for Philadelphia and intermediate stations at 6 p. m. and for Washington, 7,00 p. m.

Military tickets will not be received in the 8 a. m. or 7 p. m. trains.

RETURN TRAINS.

Leave Philadelphia at 1.15, 3.35, 8 and 11.15 a. m. and 2 50, 4.30, and 6.45, p. m. arriving in New York at 4.42, 7.02, 12.05, and 2.55, a. m. and at 6.22, 8.20, and 10.27 p. m.

BIRD, PERKINS & JOB,

(Formerly J. P. Melledge & Co.,)

General Commission Merchants,

And Importers of

PROVINCIAL COAL,

For Gas, Steam and Iron Manufactures.

20 India Wharf, ... Boston.

SAM'L T. BIRD, JAMES D. PERKINS, DANIEL W. JOB. [134

Represented in New York by GEORGE H. BREWER, No. 104 Wall Street.

JOSEPH NASON & CO.,

No. 61 Beekman street, corner of Gold,

NEW YORK.

Manufacturers of WROUGHT IRON PIPES and Fittings for Steam, Gas and Water, Boiler Flues, Steam Boilers, Coils, Heaters, Evaporators, Pumps, Ventilating Machinery, and Apparatus for Warming Buildings by Steam and Hot Water.

OIL TUBING, CAST IRON DRIVING PIPE, Boring Tools, Oil Pumps, Sand Pumps, Stuffing Boxes, Tongs, Clamps, Swivels, Joints, &c. 131

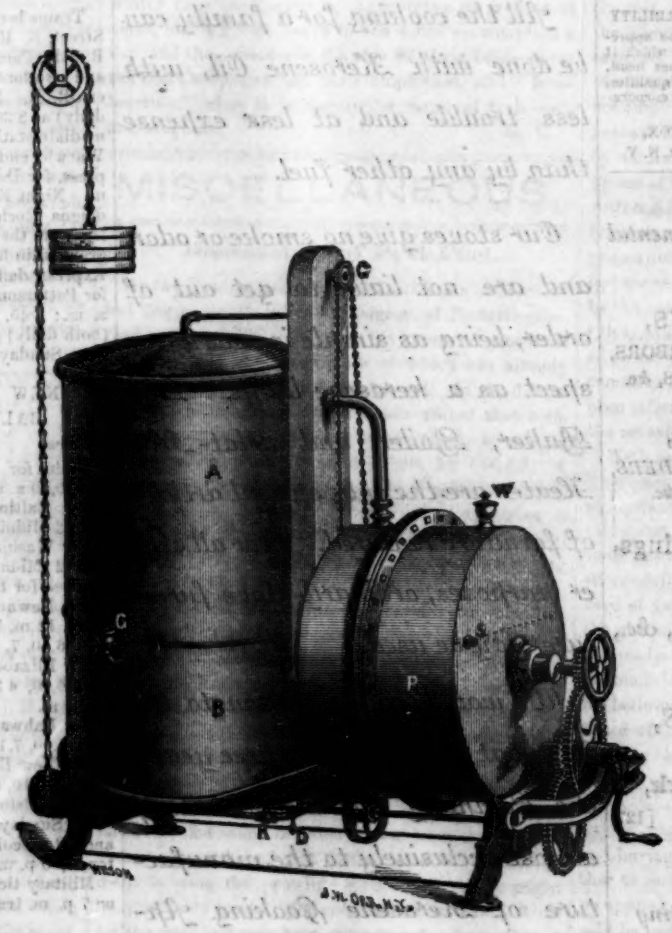
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the element brought into use, seam best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6587. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The gas produced, its permanency, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



CASH PRICE-LIST OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1	$150,00	5	Argand Burners.
do. 2	250,00	10	do. do.
do. 3	350,00	20	do. do.
do. 4	450,00	35	do. do.
do. 5	600,00	60	do. do.
do. 6	1,000,00	125	do. do.
do. 7	1,500,00	250	do. do.

This machine will produce the most brilliant and steady light, without Fire or Heat, and is warranted to operate in every respect as represented.

The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heatin and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordinary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

☞ The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also, Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches, Public Buildings, Dwellings, &c.

Gas Fixtures and House Furnishing
GOODS,
E. V. HAUGHWOUT & CO.,
488, 490 and 492 Broadway.
Corner of Broome street, New York,
Manufacturers and dealers in
CHANDELIERS & GAS FIXTURES
Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced prices, in view of the recent fall in gold. Their *Glass and Fire Gilt Chandeliers, are of entirely new designs,*
And well worthy of attention by those who wish to purchase
☞ *Fine Fixtures for their Houses.*

OFFICE OF WM. DAVIDSON,
INSPECTOR OF GAS METERS FOR THE STATE OF NEW YORK,
☞At the above address.

Architectural Iron Works,
13th and 14th streets, near Avenue C.
☞BRANCH OFFICE, 42 DUANE STREET *NEW YORK.*
OFFICERS: D. D. Badger, President. N. Cheney, Vice Pres. & Act. Tr. C. C. Gordon, Secretary Pro Tem.
PRODUCTS:
Iron and Fire-Proof Buildings, Iron Fronts, Rolling Shutters, Roofs, Domes, Bridges, Railings, Verandahs, Balustrades, Stairs, Cornices, Columns, Capitals, Arches, Window Lintels and Sills, Consoles, Brackets, Rosettes, Urns, Door and Window Guards, Lamp, Awning and Horse Posts, Venetian Blinds, Patent Lights, Iron Side Walks, Rolled, Riveted and Cast Iron Beams and Girders, and all Architectural and General Iron Work.
H. M. Bailey, Superintendant of Works.
J. Walter Clark, Accountant. J. M. Duclos, Arch.

GLYCERIN
For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.
We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr. J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.
HARTMAN & LAIST,
Office No. 71 Main street, Cincinnati —Chemical Works on Providence st, and Miami Canal, near Findlay st.

CERTIFICATE.
Office Louisville Gas Co., Louisville, June 28, 1865.
This is to certify, that the Louisville Gas Co. have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati, in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.
J. LAWRENCE SMITH, President.
Office Cincinnati Gas Light and Coke Co., July 7, 1865.
This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since. It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg. Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.
☞L. BRUCKMAN, 107 Warren street, up-stairs, Agent for New York.

NEW YORK
Fire Brick and Clay Retort Works
☞ *Established in* 1845,☜
(Branch Works at Kreischerville, Staten Island,)
B. KREISCHER,
Office 56 Goerck St, cor. Delancey, New York.
Gas Retorts, Tiles and Fire-Brick of all shapes and sizes. Fire Mortar, Clay, and Sand.
Articles of every description made to order at the shortest notice.
B. KREISCHER.

J. H. GAUTIER & CO.,
MANUFACTURERS OF
Gas Retorts, Tiles, Fire Brick,
Black Lead Crucibles, and Carburet of Iron Stove Polish,
JERSEY CITY, N. J.
Refer to—Manhattan Gas Light Co., New York. [135

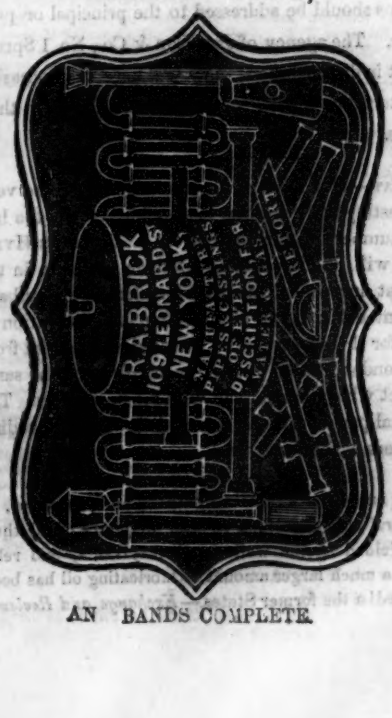
J. K. BRICK & Co.,
BROOKLYN CLAY RETORT,
—AND—
FIRE BRICK WORKS,
VANDYKE STREET, BROOKLYN, N. Y.
JOSEPH K. BRICK, EDWARD D. WHITE.

MANHATTAN
Fire Brick & Enamelled Clay Retort Works,
MAURER & WEBER,
(Of the late firm of B. Kreischer & Co.)
PROPRIETORS.
Office & Works in 15th street, Avenue C,
MANUFACTURERS OF
Fire Brick and Tiles,
OF ALL SHAPES & SIZES,
Fire Mortar, Clay and Sand.
☞Articles of every description made to order, at short notice. (135
HY. MAURER. ADAM WEBER.

Philadelphia Fire Brick Works,
Corner of Vine and Twenty Third sts., Philadelphia,
JOHN NEWKUMET,
Manufacturer of all kinds of Fire-Brick, Gas-House Tiles, to suit all the different plans in use. Clay Retorts and Dentists Muffles. Orders filled at short notice.

OREGON IRON FOUNDRY,
738, 740, 742 and 744,
Greenwich Street, New York.
CASTINGS FOR
GAS WORKS
OF ALL DESCRIPTIONS, INCLUDING
Purifiers, Exhausters, Compensators, Self-Acting Valves, Branches, Bends, &c.
FLOYD'S PATENT
Malleable Iron Retort Lid.
SABATTON'S PATENT
Furnace Door and Frame.
Refers to—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C Mowton, Engineer New York Gas Light Co.—J. Mowton Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.
135] HERRING & FLOYD, Proprietors,
SILAS C. HERRING. JAMES R. FLOYD

Cooking & Heating
BY GAS.
CHEAPER THAN COAL OR WOOD.
The "EAGLE" Gas Heating
STOVES,
Positively guaranteed free from Smoke or Smell.
Will Heat Offices, Parlors, Dining, Sleeping, and Bat Rooms. Also,
The EAGLE Gas Cooking
STOVES & RANGES,
Will BOIL, BROIL, ROAST, BAKE, TOAST,
STEW, and HEAT IRONS
The EAGLE GAS STOVES and RANGES have been in use for over Three years, and are found to be the most SIMPLE, COMPLETE and PERFECT Arrangment for HEATING and COOKING, in every respect, ever invented, and to do the Work with LESS TROUBLE, in LESS TIME and at LESS EXPENSE than any Coal or Wood stove.
Their WONDERFUL NEATNESS, CONVENIENCE and ECONOMY can be seen at a glance.
WE ALSO MANUFACTURE
COAL OIL STOVES,
For Cooking and Heating.
The American Advertising agency 389 Broadway, N Y. Bus. Dept., E. Alvord, cor. Dept., Fowler & Wells, receive orders for our stoves.
EAGLE GAS STOVE MANUFACTURING CO.
No. 474 BROADWAY, N. Y
☞The Company have descriptive Catalogues, which will be sent or delivered, upon application for them.

DRIVING PIPE,
BERGEN IRON WORKS,


OFFICE 109 LEONARD STREET, NEW YORK.
AN BANDS COMPLETE.

The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

At No. 22 Pine Street, New York.

JAMES W. BRYANT, } EDITORS.
M. P. CALLENDER, }

WEDNESDAY, MAY 2, 1866.

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at Tribune Buildings, No. 1 Spruce St. on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, PROPRIETOR.

M. P. CALLENDER, PUBLISHER.

PROF. C. ELTON BUCK, CONSULTING CHEMIST.

SUBSCRIPTION—Three dollars per annum in advance.

ADVERTISEMENTS.—One dollar per inch in column for each insertion. Large space or long time by special contract.—Payable in advance.

☞ All communications to be addressed to "The Editor," No. 22 Pine Street, New York

AGENTS.

PHILADELPHIA—JOY, COE & CO., No. 441 Chestnut st. cor. 5th.

Germany.....B. WESTERMAN & Co., of New York.

Great Britain....TRUBNER & Co., 60 Paternoster Row, London.

France.....} LE JOURNAL DE L'ECLAIRAGE AU GAZ, 25 Boulevard Poissonnière.

☞Our subscribers would confer a favor upon us by remitting *checks, or Post Office Money orders*, as we are frequent losers by money sent by mail.

☞We should be pleased to make our journal an organ of intelligent discussion for those of our subscribers and readers who may wish to gain, or give information on the subjects to which our columns are devoted. We solicit letters from those who make the study of gas a pleasure as well as a profession.

Take Notice.

Visitors and correspondents will please take notice that after this date the business and publication office of this Journal is at 22 PINE STREET, opposite the Sub-Treasury Building. All communications should be addressed to the principal or publisher. The agency of JOY, COE & Co., No. 1 Spruce street is discontinued; and we here take occasion to return our thanks for courtesies received at their hands.

PEAT.—Our readers who have followed the very interesting articles upon Peat published in the last few numbers of our Journal, by J. BURROWS HYDE, Esq., will be disappointed by their omission in the present number. Unlooked for circumstances have prevented Mr. HYDE from giving it his attention in time for this paper, and in its stead we re-print from the London Mining Journal an article upon the same subject which will be read with much pleasure. The original papers will be resumed in the succeeding numbers of the JOURNAL.

THE PEROLEUM WELLS in Kentucky and Tennessee, as a general rule furnish a greater diversity of oil than that yielded by the wells in Pennsylvania, and relatively a much larger amount of lubricating oil has been obtained in the former States.—*Exchange and Review.*

Nitro-Glycerine.

This most powerful of all known explosive compounds—and, as is being every day made painfully apparent, the most destructive when uncontrolled—has formed one of the chief topics of conversation and of the press for the past two weeks, and has also been the subject of official and legislative attention.

This compound is of Sweedish invention, and has been known to science for twenty years, though it has but recently been applied to mechanical uses by M. Nobel, also a Swede, who first introduced it into this country about three years ago. It is especially intended for blasting purposes in the stead of gunpowder, over which, leaving danger out of the argument, it possesses many advantages, one of which is possessing ten times the explosive force of powder; and another, ease of application, not only in ordinary blasting operations, but also under water, and in other places where powder is not practicable.

Our readers cannot have forgotten the first intimation they received of its dangerous and destructive qualities in the Wyoming Hotel explosion in this city about a year ago. The excitement and apprehension consequent upon that disaster had almost if not entirely died out of the public mind when we are again horrified by details of a similar though far more serious explosion in front of Wells, Fargo & Co.'s Express Office, in San Francisco, Cal, causing the death of twenty persons and destruction of $200,000 worth of property, the compound having been shipped from this city by express to parties in California and Idaho.

Enquiries were at once suggested and instituted as to its character and the character of its sale and traffic in this city, when the fact was discovered that a company engaged in its sale had an office in one of our principal business streets where they kept limited quantities, and were in the practice of shipping it in various sized packages with no safeguards being thrown around it—not even a mark on the outside of the package denoting what its contents was, and even at that time packages were lying in bonded warehouses awaiting removal. This, and all other that could be found, was seized by the officers and stored where it could do no harm, until proper regulations and restrictions should be applied to its storage and transportation. Following close upon the footsteps of this last explosion, though of earlier date, comes news of still another and more fearful one at Aspinwall, whereby from fifty to seventy lives were lost and a million of dollars in property destroyed. The explosion took place on board the British steamer "European" while lying at the wharf discharging her cargo, amongst which was 200 cases of this compound.

What has been the immediate cause of these explosions is yet undetermined. Several theories have been advanced in solution of the mystery, the most reasonable of which is by the inventor, who claims them to have been owing to improper packing; that in each instance the cases leaked, and the compound uniting with the sawdust in the boxes in which the cases were packed, formed a new compound which will ignite at much lower temperature, and in burning raise it to the required 360° at which the nitro-glycerine explodes.

We have hitherto looked upon nitro-glycerine with much favor, believing it an important advancement upon the path of science, and likely to work important changes in mining operations, and can hardly believe it will be abandoned in this progressive country. Where nitro-glycerine is better understood than in this country—Sweden, Germany, and elsewhere—it already supersedes all other blasting explosives, and is considered less dangerous in manipulation than even gunpowder, and we can but believe that with proper knowledge of its character and ordinary precaution accidents may be prevented and it be made to prove what is claimed for it—the superior of all other explosive compounds for mining operations.

A MATCH FACTORY.

A match factory in Western New York is noted for the curious machinery used in the manufacture. 720,000 feet of pine of the best quality are used annually for the matches, and 400,000 feet of basswood for cases. The sulphur used actually for the matches is 400 barrels, and the phosphorus is 9,600 pounds. The machines run night and day, and 300 hands are employed at the works. 500 pounds of paper per day are used to make the light small boxes for holding the matches, and four tons of pasteboard per week for the larger boxes. Sixty-six pounds of flour per day are used for paste, and the penny stamps required by Government on the boxes amount to the sung little sum of $1,440 per day.

There are four machines in use for cutting, dipping and delivering the matches. The two inch pine plank is sawed up the length of the match, which is 2¼ inches. These go into the machine for cutting, where at every stroke 12 matches are cut, and my the succeeding stroke pushed into slats arranged on a double chain 350 feet long, which carries them to the sulphur vat, and from thence to the phosphorus vat, and thus across the room and back, returning them at a point just in front of the cutting machine, and where they are delivered in their natural order, and are gathered up by a boy into trays and sent to the packing room. Thus, 1 000 gross or 144,000 small boxes of matches are made per day. The machines for making the small, thin paper boxes and their covers are quite as wonderful and ingeniously contrived as those that make the matches. A long coil of paper, as wide as the box is long, revolves on a wheel, one end being in the machine. It passes through rollers, where the printing is done, from thence to the paste-boxes, where the side and ends only are pasted, from thence to the folding-apparatus, where the ends are nicely folded and the whole box is pasted together and dropped into a basket. A similar machine is at work at the covers, and thus 144,000 boxes per day are manufactured.—*Am. Exchange and Review.*

MANUFACTURE OF MAGNESIUM.

THE manufacture of the metal magnesium is now rapidly on the increase in the United States, as well as in Europe. It is an illuminator of the most intense brilliancy, and serves the photographer better than the sun.

Magnesium is the metallic base of magnesia, the latter being the oxide of magnesium. It is found combined with carbonic acid, and when the carbon is expelled by heat, the well known calcined magnesia of pharmacy is produced.

Magnesium is a silver colored metal, mallable and ductile, fusing at a dull read heat. When heated to redness it consumes with a brilliant white flame. It oxidizes rapily in damp air, but does not change under water or in dry air.

It is reduced from the chloride: 600 parts chloride of magnesium, 100 parts fused chloride of sodium (or better, a mixture of 7 parts chloride of sodium and six parts chloride of potassium), 100 parts pure pulverized fluorspar are to be intimately mixed, and to the mass 100 parts sodium in fragments added, and the mixture projected into a hot crucible and covered. After the first energetic decomposition has passed, the fused mass must be stirred. The magnesium will be gathered in globules, and can easily be separated from the slag. It is afterwards purified by downward distillation. The metal can be drawn into fine wire, and is now extensively used as light in photography. Two ounces of magnesium will produce a light during ten hours equal to that afforded by 74 stearine candles, of 5 to the pound, consuming 20 pounds of stearine.

AN INEXPLICABLE PHENOMENON.—Nashville, Tenn. consumes thirteen hundred thousand gallons of water per day.

A NEW MATERIAL FOR SCULPTORS.—M. Henry St. Claire Deville lately communicated to the Academy of Sciences of Paris, the fact that magnesia obtained by calcination from chloride of magnesium will, when exposed to the action of water for some months, acquire considerable consistency, and become hard enough to cut marble. A lamina of this magnesia of moderate thickness is translucid like alabaster. With this substance M. Deville has been enabled to take casts, as if with plaster of Paris, only the former sets under water. A mixture of chalk and magnesia in powder made up into a paste with water is good for moulding, and will become exceedingly hard under water.

TO ADVERTISERS.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c., especially from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

FOR SALE.

A SET OF PURIFIERS, CAST IRON BOXES and wrought iron covers, all complete and in good working order. Suitable for a small works, and will be sold cheap. For particulars address J. W. GRAHAM, Sec'y.
53-56 Chillicothe, Ohio.

THE WOODWARD
Steam Pump Manufacturing Company,
MANUFACTURERS OF THE WOODWARD PATENT IMPROVED
SAFETY STEAM PUMP,
—Adapted for Mining and Fire Perposes—and
Steam, Water & Gas Fittings of All Kinds.
Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,
Woodward Building, 76 and 78 Centre St.,
Corner of Worth Street, Formerly 77 Beekman Street. *New York.*
53 GEO. M. WOODWARD, Pres't. 64

A. HITCHCOCK,
Inventor and Manufacturer of the
Cam Quartz Breaker and Pulverizer,
REVERSIBLE ROLLER MILL,
IDAHO MILLS & AMALGAMATORS,
Adapted to All Kinds of Power.
Unequalled for utilizing power—avoiding friction and wear,—rapidity of work, and facility of transportation and adjustment.
Also, **Hitchcock's Adjustable Tubular Flue-cleaning Boiler,** and other valuable Patents, for which license to manufacture will be granted on reasonable terms.
Circulars furnished on application.
53-76 *Office No. 4 & 6 Pine Street, New York.*

THOMAS CASSIDY,
Iron Founder & Pattern Maker
Corner Hudson and Park Avenues,
BROOKLYN.
Iron Store Fronts put up at short notice.
Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.
A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.
Lamp Posts—Brooklyn Pattern.
☞ A large stock of the usual sizes of Round Columns kept on hand.

FOR SALE.

A SET OF PURIFYING BOXES, 5 x 10 FEET, with Covers and Hoisting Apparatus, Center Seal, Connecting Pipes, &c., with eight-inch openings, nearly new, and in perfect order. Offered at a low price on account of being too small for the works. Apply to or address
HARTFORD CITY GAS LIGHT CO.,
53-56 Hartford, Conn.

R. L. DELISSER & CO.,
DEALERS IN MINERAL LANDS
—AND—
PATENT RIGHTS,
No. 69 Beaver St., NEW YORK.
152-176

MOREY & SPERRY,
Manufacturers of
HEPBURN & PETERSONS, AND BEATH'S
Amalgamators, Stamp Mills,
Quartz Crushers, and other
MINING MACHINERY.
ALSO AGENTS FOR
Foundries in San Francisco, Cal., and are prepared to make time contracts to erect Mills completed, on the premises in California, Nevada and other Territories.
Office No. 95 LIBERTY ST., Rooms 10 & 11.
152-176 **New York.**

PERCE'S MAGNETIC GLOBES,
AND
PERCE'S MAGNETIC OBJECTS.

A beautiful Terrestial Globe, elegantly mounted and colored, and supplied with
MAGNETIC MEN,
MAGNETIC LADIES,
MAGNETIC SHIPS,
MAGNETIC STEAMERS,
MAGNETIC FLAGS,
MAGNETIC LIONS,
MAGNETIC BEARS,
MAGNETIC ELEPHANTS,
MAGNETIC LIGHTHOUSES,
etc., etc., forming a
MINIATURE MAGNETIC WORLD.

PERCE'S MAGNETIC GLOBE has won the warmest ecomiums from the press; from men of science, and from all lovers of the beautiful and useful in science, in art, wherever it has been seen. As an article of HOUSEHOLD FURNITURE, it is elegant and useful; "as useful," says the New York *Independent*, "for the entertainment and instruction of the little ones at home as the piano, or any other instrument for domestic amusement and instruction."

"PERCE'S MAGNETIC GLOBES AND MAGNETIC OBJECTS afford a wide field for many pleasing and surprising experiments; and with it, aided by the explanations which accompany it, our young readers will be able to conjure up many interesting illustrations and games which they will find profitable and amusing."

STYLES AND PRICES.

Perce's Magnetic Globe, 5 in. dia., Plain Stand,	$ 5
Perce's Magnetic Globe, 5 in. dia., Brass Meridian,	7
Perce's Magnetic Globe, 7 in. dia., Plain Stand,	10
Perce's Magnetic Globe, 7 in. dia., Brass Meridian,	25
Perce's Magnetic Globe, 12 in. dia., Plain Stand,	20
Perce's Magnetic Globe, 12 in. dia., Brass Meridian,	25

The Globes of all the above sizes and styles are finished in the highest style of the art, are mounted on polished black walnut stands, and will form an elegant and attractive ornament for the parlor, library or drawing-room.
One dozen of Perce's Magnetic Objects, with plainly written directions, accompany each globe without additional cost.
All Globes and Objects are packed neatly in boxes, and will be sent safely any distance by express, freight paid, on receipt of price.
CHARLES SCRIBNER & CO., Publishers,
151 No. 124 Grand-st., New-York.

SCHOOL OF THE
Mass. Institute of Technology,
BOSTON.
A professional school for the Mechanical, Civil or Mining Engineer, Practical Chemist, Builder and Architect—also provides a general education founded upon the Sciences, Modern Languages and Mental and Political Philosophy. Requisites for admission—Arithmetic, Algebra, Geometery, English Grammar, Geography, and the rudiments of French. Examinations for admission, June 4th, and Sept. 29th. Special students admitted to partial courses without examination. For catalogue, apply to WM. P. ATKINSON, Sec.

PERCIVAL PATENT STOP-COCK.
WANTED.—An energetic business man to introduce this invention. For description and particulars, Address Geo. G. Percival,
Philadelphia, Pa.

WILLIAM S. CARR & CO.,
Successor to Sawyer & Co.,
SOLE MANUFACTURERS OF
Carr's Patent Water Closets,
URINAL VALVES, &c.
Also Manufacturers and Dealers in PLUMBING MATERIALS OF EVERY DESCRIPTION, Plumbers' Brass Works, Earthen Ware, Pumps, Iron Drain Pipes, Traps and Sinks, Copper Bath Tubs, Showers, &c., &c.
OFFICE AND MANUFACTORY
149, 151, 153, 155, 157 Centre Street, cor. Canal,
NEW YORK.
Illustrated Catalogue and Price List sent on application.
152-176

NATIONAL FOUNDRY
AND PIPE WORKS.
Office and Works—Carroll, Pike, Smallman and Wilkins Streets,
PITTSBURGH, PA.
WM. SMITH,
Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.
I offer special inducements to parties wishing to purchase, as my Pipe is Smooth, regular in weights, and cast vertically.
N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.
☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
149

O. B. GRAY.
DEALER IN ALL KINDS OF
INDIA RUBBER GOODS
Vulcanized Machine Belting,
Conducting, Hydrant, and Engine Hose,
GUM STEAM PACKING,
Amidon's Improved Clothes Wringer,
And all kinds of Useful and Fancy Rubber and Vulcanite Goods,
No. 201 Broadway,
Middle of the Block between Fulton and Dey Streets, NEW YORK.

J. E. STEVENSON,
40 Dey Street, New York,
Hydraulic & Mechanical Engineer,
MILLWRIGHT AND MANUFACTURER OF THE
Helical Jonval Turbine Water Wheel,
☞ Stevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860
☞ Particular attention paid to the improvement of WATER POWERS AND MILL SITES. Surveys made, plans, specifications, and estimates made.
☞ General agent for the purchase and sale of all kinds of mill property and machinery.
☞ Contracts for furnishing Turbines, Overshot or Breast Wheels, Mill Gearing, Shafting, Pulleys, and all iron work for Cotton, Woolen, Grist and Saw Mills. Heavy castings made to order. 53-76

EMPIRE LINE
FOR SAVANNAH, GEORGIA,
Every Saturday, the elegant Side-Wheel Steamships
SAN SALVADOR,
Commander, Joshua Atkins, and
MISSOURI,
Commander, Winslow Loveland.
Every SATURDAY, from pier 13 North River.
Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.
The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river

San Jacinto, Saturday, March	3	San Salvador, Saturday, Mar.	24
San Salvador, ...	10	Missouri, ...	31
San Jacinto, ...	17	San Salvador, ..	April 7

Returning, leave Savannah every Saturday at 3 o'clock, P. M.
Bills of Lading furnished and signed on the Pier.
For further particulars, engagement of Freight or passage, apply to
GARRISON & ALLEN, Agents,
No. 5 Bowling Green.
Agent at Savannah, B. H. HARDEE.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,

No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	86	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	30	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8½	5 00
35	10	6 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by turning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 36 Dey Street, N. Y.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though used at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Federal st., Boston.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences,
Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches

561 Broadway,
NEW YORK.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENET

POOLE & HUNT,

BALTIMORE, MD.,

are prepared to execute orders for

GAS-HOLDERS,
IRON-ROOF FRAMING,

And other descriptions of

Iron Work for Gas-Works, Water-Pipes, and Heavy Castings,

and Machinery generally.

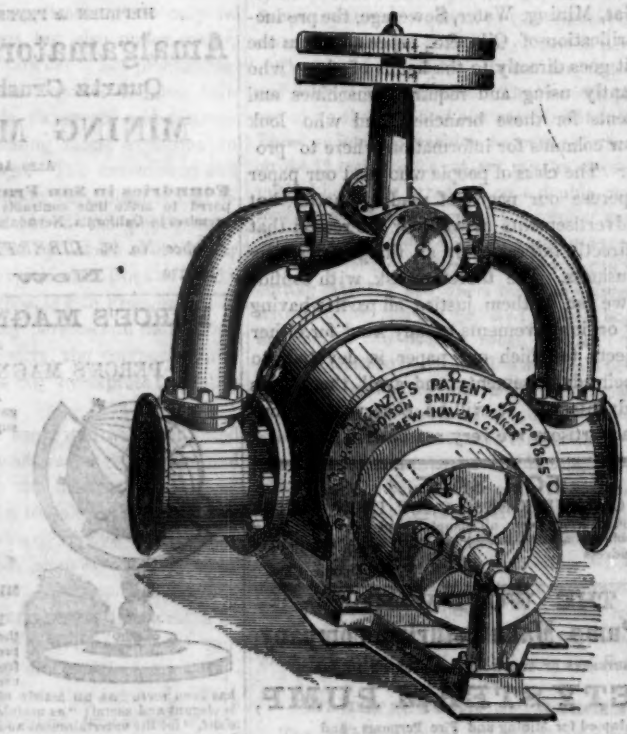
SMITH & SAYRE,

MANUFACTURING COMPANY.

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the tion and illuminating power of the gas, and add very much to the durability of the retorts, clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, dur cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address

Office 434 Broadway, New York.

B. KREISCHER., Prest. JAS. SAYER, Treas, CHAS. W. ISBELL, Sec'y

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821.]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. CORE.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam & Hand Air Pumps for providing Street Mains Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS,

5th and Washington Sts, Philadelphia.

Petroleum Directory.

AMERICAN PETROLEUM CO.
10 Pine street. [$500,000.]
E C Clarke, Pres. Jas. Wadsworth, Sec.

BLOOD FARM PETROLEUM CO.
10 Pine street. [$5,000,000.]
C. Butler, Pres. G. H. Scribner, Sec.

COLUMBIA PETROLEUM CO.,
42 Cedar street. [2,500.000.]
B. Goe, Pres. E. Westervelt, Sec.

CHERRY CREEK FARM PET. CO.,
8 & 10 Wall street. [$2,000,000.]
L. G. Capers, Pres. J. A. Ferguson, Sec.

CENTRAL PETROLEUM CO.
10 Pine street. [$5,000,000.]
J. Bishop, Pres W. W. Clark, Sec.

GERMANIA PETROLEUM CO.,
33 Pine street, [$3,000,000.]
J. F. Schepeler, Pr. C. Throckmorton, Sc

GREAT WESTERN CONSOLIDATED
27 Wall street. [$4,000,000.]
F. A. Van Dyke, Jr. Pr. F. W. Potter, Sy

GREAT NORTHERN PETROLEUM,
67 Exchange Place. [$2,000,000.]
J. Bryan, Pres. J. A. Wisner, Sec.

HOFFMAN PETROLEUM CO.
10 Pine street, [$5,000,000.]
G. W. Abbe, Pres. J. P. Hogarth, Sec.

HOME PETROLEUM CO.
10 Pine street. [$5,000,000.]
Josiah Oakes, Pres. E. Dwight, Sec

JOHN ANDERSON PET. CO.
106 Broadway, [$2,000,000.]
A. G. Curtin, Pres. E. O. Perin, Sec.

LITTLE KANAWHA & ELK RIVER,
61 Cedar street, [$6,000,000.]
O. E. Wood, Pres. J. Wadsworth, Sec.

OIL CITY PETROLEUM CO.
8 Pine street, [$500,000.]
D. S. Duncomb, Pres. C. C. Pinckney, Sc

PACIFIC COAST PETROLEUM CO.
71 Broadway. [$5,000,000.]
J. De Peyster Ogden, Pres. L. Benton, Sc

RATHBONE OIL TRACT PET. CO.
69 Wall street. [$5,000,000.]
J. P. G. Foster, Pres. A. L. Purves, Sec.

RYND FARM PETROLEUM CO.,
8 Broad street, [$2,000,000.]
S. J. Macy, Pres. J. F. Jenkins, Sec.

SECOND NATIONAL PET. CO.,
100 Broadway. [$3,000,000.]
M. S. Frost, Prest. J M. Bruce, Jr., Tr

TARR FARM PETROLEUM CO,
61 Cedar street. [$3,000,000.]
J. Wadsworth, Pres. C. W. Ware, Sec.

UNITED REPUBLIC PET. CO.
74 Broadway. [$2,500,000.]
E. J. Lowber, Pres. J. H. Kidder, Secy.

UNITED PETROLEUM FARMS CO.
10 Pine street. [$10,000,000.]
G. H. Bissell, Pres. J. P. Hogarth, Sec.

VIRGINIA & OHIO PETROLEUM CO.
51 Broad street. [$1,000,000.]
B. Schieffelin, Pres. E. Siebeer, Sc.

WINONA PETROLEUM CO.
5 William street. [$1,000,000.]
J. N. Tappan, Pres. J. D. Fish, Treas.

WEST VIRGINIA OIL & COAL CO.
71 Broadway, [$3,000,000.]
A. F. Ball, Pres. F. A. Miller, Se.

Great Improvement IN Sewing Machines.

EMPIRE SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No. 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

WILCOX & GIBBS SEWING MACHINE

It is entirely noiseless.
A patented device prevents it being turned backward.
The needle cannot be set wrong.
It received the Gold Medal of the American stitute in 1863.
InSend for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILLCOX,
Manufacturer, 508 Broadway, New York
Principal Offices:
NEW YORK—508 Broadway.
BOSTON—323 Washington street.
PHILADELPHIA—720 Chestnut street.
CHICAGO—133 Lake street.
CINCINNATI—70 West 4th street.
LONDON—135 Regent street.
HAMBURG—44 Hermann street.
PARIS—99 Boulevard de Sebastopol.
ST. PETERSBURGH—15 Gorochevay.
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, AUSTRALIA—292 Pitt street

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
formerly No. 447 BROOME ST., New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' BOVING APPARATUS, &c.
529 Commerce st., bet. Market & Arch, Philadelphia.

WOODEN PURIFYING TRAYS PATENT

Conically Slotted Solid Wood Sieves FOR PURIFIERS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.

Manhattan, New York,
Metropolitan,
New York
Albany
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore Md.
Louisville, Ky.
Chicago, Ill
Cambridge,
And numerous others

Orders received by mail or otherwise.
JOHN L CHEESMAN.
147 Avenue C New York City

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
No. 40 Cortland street,

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

D. PARRISH, JR.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

TO GAS COMPANIES.

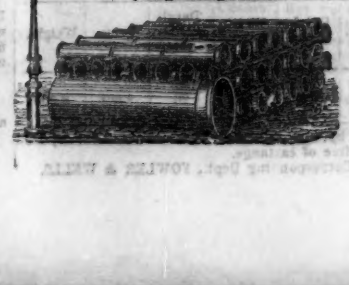
THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

THE AUBIN BALLANCED
VALVE WATER METER,
(Used also for Oils and Liquors)

Is now in use by many City Water Cos, because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Carrington & Co.'s GENERAL PURCHASING AGENCY,

In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a sea ring to a steam-engine.

Goods purchased at current City prices, and forwarded by Express, or as directed.

Commission, Five Per Cent.

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

SPECIAL CIRCULAR.

The Adams Express Company, appreciating the need of a capable medium connecting with the various Express Lines, through which personal and other orders for goods from this city, can be satisfactorily supplied, do recognize CARRINGTON & CO.'S GENERAL PURCHASING AGENCY as such a medium for filling orders for every description of goods wanted from New York, and commend it to the attention of the public, and of our general and local agents, recommending our agents to extend to it all reasonable aid, by facilitating the distribution of its cards and circulars, and making known the advantages it affords.

ADAMS EXPRESS CO.
By W. B. DINSMORE, Prest.
NEW YORK, June, 1864.

We cheerfully concur in the above recommendation of the Adams Express Company.
AMERICAN EXPRESS COMPANY,
By HENRY WELLS, Prest.
UNITED STATES EXPRESS COMPANY,
By D. N. BARNEY, Prest.
WELLS, FARGO & CO.,
NATIONAL EXPRESS COMPANY,
By J. A. ULLEN
HARNDEN EXPRESS,
By L. W. WINCHESTER, Supt.
KINSLEY & CO.'S EXPRESS,
By E. LITTLEFIELD, Supt.
HOPE EXPRESS COMPANY,
A. D. HOPE, Supt.
BREESE & CO.'S EXPRESS,
By STEPHEN BREESE, Supt
NEW JERSEY EXPRESS COMPANY,
By GEORGE R. DUNN, Sup

The Greatest Improvement yet in the Sewing Machine Art!

A CURIOSITY WORTH SEEING!

Please send for circular with samples of sewing.

These Improved Machines save ONE HUNDRED PER CENT. of thread and silk, and make the LOCK-STITCH alike on both sides.

They require no instruction to operate perfectly, except "the printed directions."

No change in sewing from one kind of goods to another.

And no taking apart to clean or oil.

Our NEW MANUFACTORY is now complete, with all its machinery and tools entirely new, and is already rapidly turning out Machines which for BEAUTY and PERFECTION of FINISH are not surpassed by any manufacture in the world.

N. B.—Should any Machine prove unsatisfactory, it can be returned and money refunded.

Agents wanted in counties not vassed by ur own agents.

Finkle & Lyon S. M. Co.
No. 593 BROADWAY, NEW YORK.

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS.

499 BROADWAY, NEW YORK.

The attention of the public and the trade is invited to our New Scale Seven Octave Rosewood Piano-Fortes, which for volume and purity of one are unrivalled by any hitherto offered in this marked. They contain all the modern improvements, French, grand action, harp pedal, iron frame, over-strung bass, etc., and each instrument being made under the personal supervision of Mr. J. H Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"

Received the highest award of merit over all others' at the Celebrated World's Fair!

where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of impro ements we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1, Seven Octave, round corners, Rosewood Plain Case $275.
No. 2, Seven Octave, round corners, Rosewood Heavy Moulding, $300
No. 3, Seven Octave, round corners, Rosewood Louis XIV, style $325, a fac-simile of the accompaning cut.

TERMS—NET CASH, IN CURRENT FUNDS. Descriptive Circular sent free.

LILLIE'S

CELEBRATED

Chilled and Wrought Iron Safes,

WROUGHT IRON FIRE-PROOFS,

LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

No.	Outside. Height.	Width.	Depth.	Inside. Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.

LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

No.	Outside. Height.	Width.	Depth.	Inside. Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54⅜	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42½	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27½	23½	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19½	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD	$600
DINING ROOM	350
PANTRY (No. 1)	275
PANTRY (No. 2)	150
DUODECAGON BANK LOCK	100
MONITOR SAFE do.	50
SAFE do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

No.	Outside. Height.	Inside. Hei	Width.	Depth.	Price.
	In.	In.	In.	In.	
1	68	55	39	18	$1,200
2	61	48	39	18	1,050
3	57	42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	43	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	28		
	42	36	22	38	32	19	
4	36	31	20	32	27		
5	30	24	18	26	20	14	

BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	73	27	20	$400	3,000
2	73	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.

Business Department, E ALVORD..... Corresponding Dept., FOWLER & WELLS.

WEST'S IMPROVED PUMP.

Anti-F eezing, Double-Acting, Forcing, and Lifting

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, a guarantee that all will recommend them. They are more simple in construction, and work easie and cost less than all others.

"Our readers will find the double acting, improved pump of J. D. West & Co., one of the best in th ket. It is very simple, works to a charm, so that any child may use it; throws a steady continuous stream, and does not freeze in the coldest exposures, and is unusually cheap. We say this knowingly, and give the testimony of our own accord, without the knowledge or request of the proprietors."—*New York Evening Post, July 1st*, 1863.

"J. D. WEST & Co.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 180 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club.

Jan. 23.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be a once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it.... to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year.... I know this, and think I may be doing the farmers good by speaking of it.... A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream.... It can be made to work in deep wells as well as in shallow ones."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESSEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1863.

"J. D. WEST & Co.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'W s Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly work, 24 hours of each day (save Sunda , and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 40 Cortlandt st., New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

LESLEY & ELLIOT,
Manufacturers, No. 494 Broadway, New York.
Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,
389 Broadway, N. Y.
Send for a Circular—Agents wanted.
DALTON KNITTING MACHINE CO.,
187] 587 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance, it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Below we give a few prices:

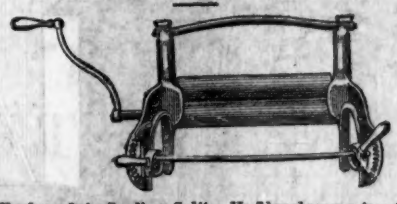
No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

WEED SEWING MACAINE Co.,
[26) 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $8 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and effectual.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January*, 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any*, to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by
PUTNAM MANUF'G CO.,
13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

WATER AND GAS PIPE.

The Boston Bituminized Pipe Company,

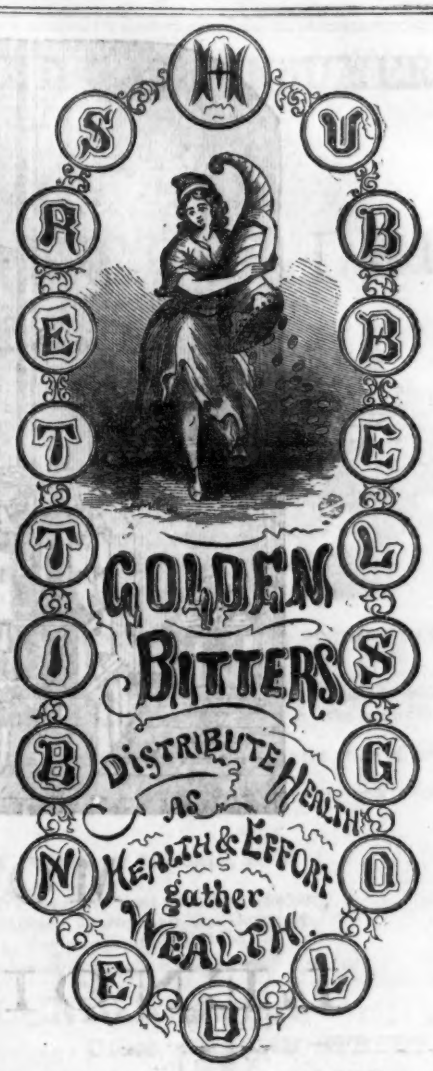
Are now manufacturing and prepared to take orders, for their PATENT PIPE, (from 2 to 12 inches in diamter,) as a substitute for Iron, Copper, Lead, &c., for the conveyance of WATER, GAS, SEWERAGE, &c. &c.

From the testimonials received, and the entire satisfaction it has given those having it in use, we feel warranted in claiming for this pipe over that of any other, the following advantages, viz:

It is much CHEAPER—has great strength (it having been tested to 500 lbs. to the square inch,) combined with LIGHTNESS, costing less for transportation; the joints are easily made and perfectly tight; it does not expand or contract from different degrees of temperature, and is free from *CORROSION* or *CONCRETIONS* forming; does not impart any taste or injurious properties to water, and as far as anything can be said to be indestructible, we deem this to be.

As a GAS PIPE, we say it has no superior. The Lowell Gas Light Co., purchased and laid some of this Pipe last year, and have likewise subjected samples to a test of four month's duration in their dry lime purifiers, with the most satisfactory results, in fact establishing beyond a doubt, its perfect adaptation to the wants and requirements of Gas Companies, specimens of which, together with the statement of E. Cushing, Esq., Agent Lowell Gas Light Co., who made these experiments, I shall be pleased to show, and give all other needed information, by applying in person, or by letter, to JOHN L. WEBSTER, Treas.,
Boston Bituminized Pipe Co.,
127] No. 2 Pearl st. House, Boston.

AMBROSE SPENCER GILCHRIST.
(LATE CAPT. U. S. V.,)
CIVIL, MINING
AND ARCHITECTURAL ENGINEER,
No. 200 BROADWAY, Office 12.
New York.



New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation,* for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage,

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public. And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

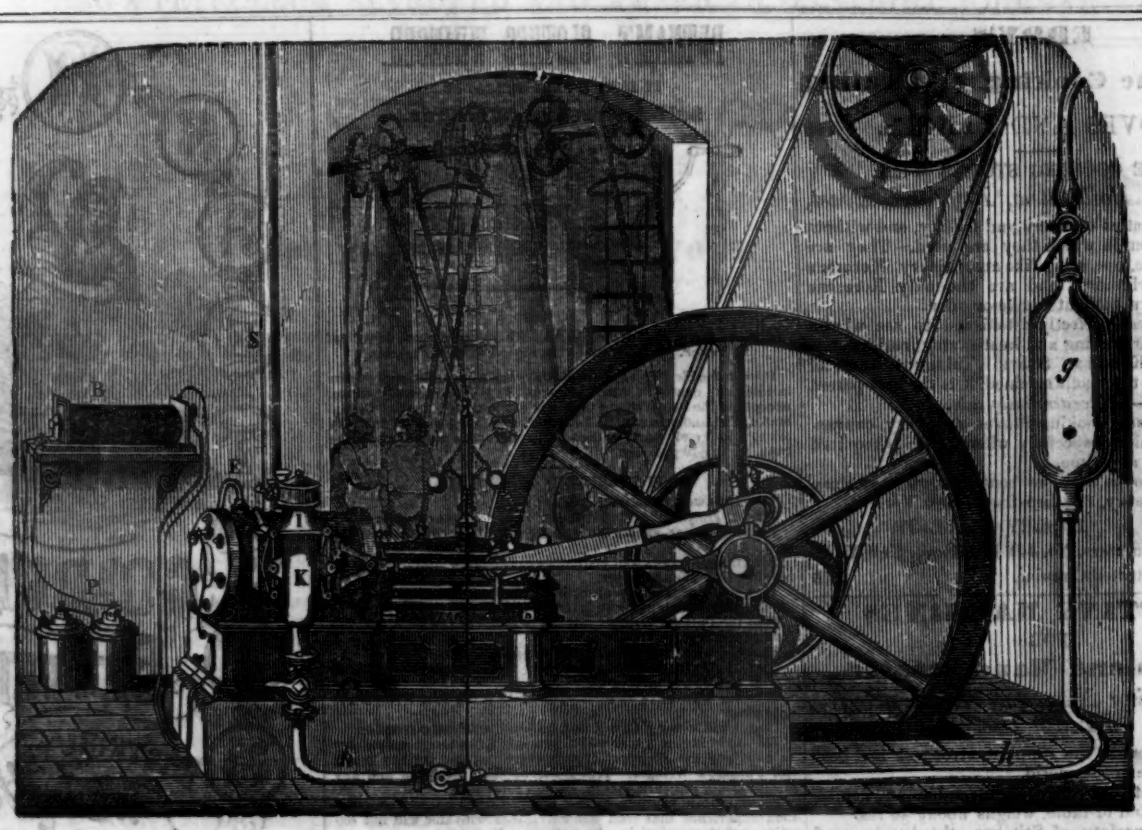
DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co., Sole Proprietors
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy to keep in the house.—*New York Weekly Day Book.*



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india-rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the Dry Dock Iron Works, No. 435 East Tenth street, near East River, New York, where they are being manufactured, and those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

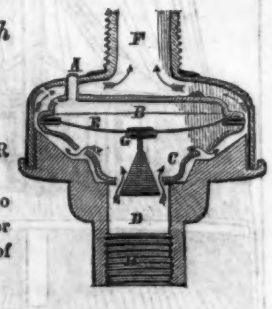
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of em five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas-light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to he public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME,	President Manhattan Gas Company, N. Y.	GEO. H. KITCHEN,	Inspector of Gas Meters, N. Y
C. H. SAND , Esq.,	President Metropolitan Gas Company, "	A. L. BOGART, Esq.,	Gas Engineer.
J. H. ADAM, Esq.,	President New York Gas Company, "	Col. J. A. SABATTON,	Engineer Manhattan Gas Company.
PETER COOPER, Esq.,	Cooper Institute, "	Col. A. J. WHITE,	Engineer Metropolitan Gas Company.
JOHN A. DUFF, Esq.,	Olympic Theatre, "	J. K. SIMPSON, Esq.,	Engineer Cooper Institute.

Persons interested are invited to call at the Office, 111 Pearl street, where they can see the operation by pressure guage and test meters.

M. L GALLENDER, Agent

Office, 22 PINE STREET.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishmen, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by

HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000. JOHN C. CRESSON, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

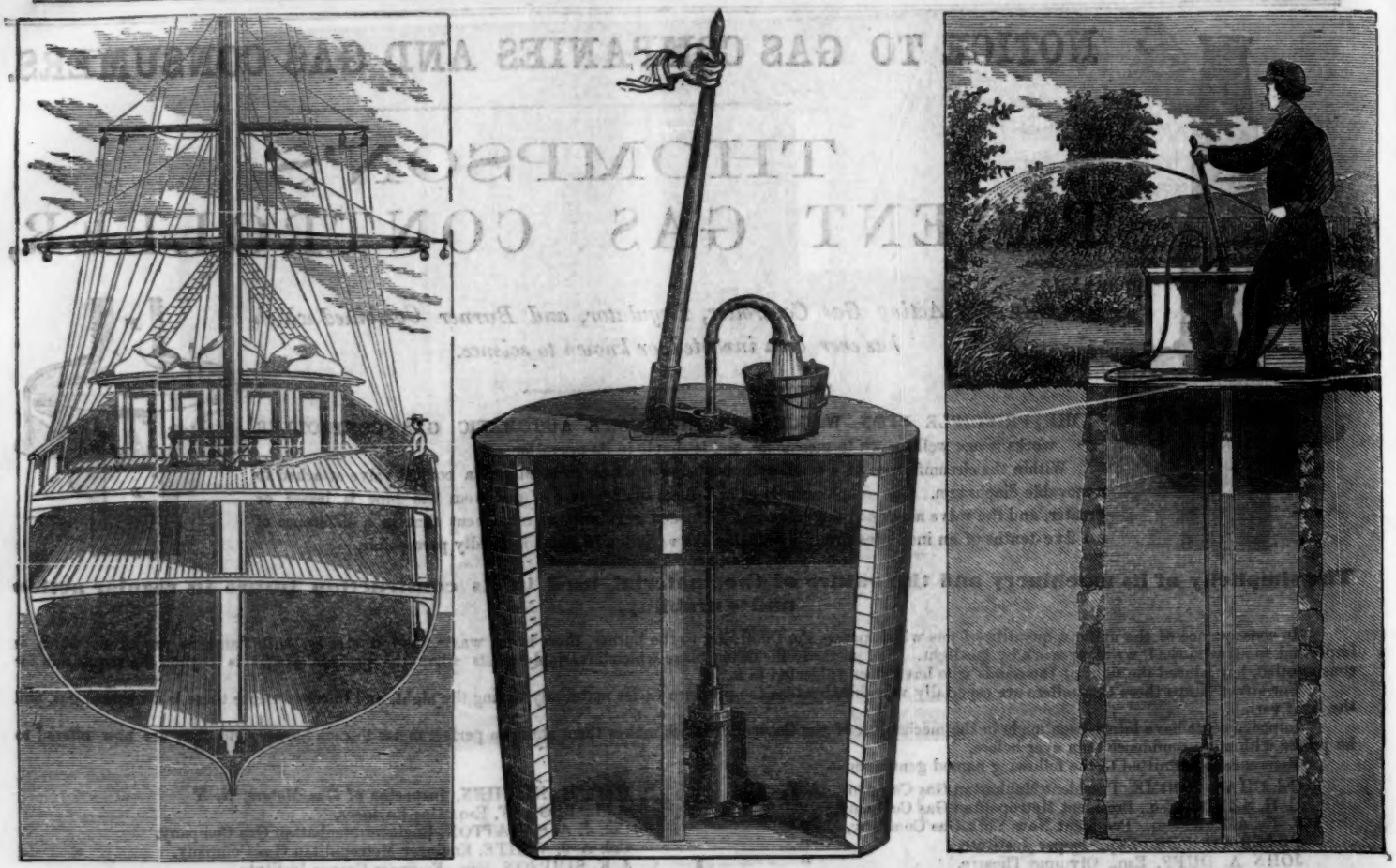
G. S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanshipall we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MEARS.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those mported from Europe, or made by any of the manufacturers in the United States. Respectfully Yours, GEORGE WIEGAND, Inspector of Gas Fittings, Philadelhia.



AMERICAN PUMP MANUFACTURING COMPANY,

DEPOT NO. 40 DEY STREET, NEW YORK.

A. B. VAN OLINDA, Secretary. C. V. B. OSTRANDER, Treasurer. E. BEADLESTON, President.

STATE AND COUNTY RIGHTS FOR SALE.

Pumps, completed, will be delivered from the manufactory of the Company, to parties purchasing rights at a royalty of One Dollar each.

THE PATENT SUBMERGED PUMP.

This valuable Invention, now first introduced, will, it is believed, supersede all classes for any purpose in use at the present time.

ITS ADVANTAGES.

FIRST.—SIMPLICITY. The entire pump is composed of but six parts, all of cast-iron, which can be put together by any mechanic.

SECOND.—DURABILITY. From the fact that it is always submerged, it is perfectly lubricated, and requires no packing. As no water can remain in the pipe when not in motion, there is no danger of freezing.

THIRD.—CAPACITY. It is contended that, for the power applied, this Pump excels all others. The No. 1 (the smallest size,) of this Pump, with the power of one hand, has a capacity of thirty gallons per minute, and will throw a stream seventy feet in the air.

FOURTH.—CHEAPNESS. For economy, this Pump surpasses all others, its first cost being about one-third less than that of other Pumps of the same capacity, and being much less both in size and weight, there is a great saving in transportation.

ITS USES.

FIRST.—For a House Pump; the smallest size of the patent Submerged Pump is sufficient for all family purposes. Placed in a well or cistern, water may be conveyed to every room in a common sized house.

SECOND.—For a Farm Pump; for all purposes connected with irrigating, watering stock, etc., etc. This Pump can be placed in running streams, ponds, bayous, etc., and water conveyed to any required distance.

THIRD.—For a Ship Pump; Any ship owner or captain, with short experience in the use of this Pump, will give his unqualified approval for ship purposes, either to be used as a bilge pump simply, or for washing decks, etc. From its simplicity, as a bilge Pump it will be found entirely free from choking, and will clear grain, dirt, stones, etc., with ease.

FOURTH.—For a Factory Pump, or for air in Oil Wells, for Breweries, or for pumping acids, hot liquors, etc., it is invaluable. It cannot be affected by any liquid.

FIFTH.—To all Directors and Officers connected with mining interests, the PATENT SUBMERGED PUMP presents great advantages.

The experience of the last five years have clearly proved at what great expense, both in first cost and freight, it has been necessary to be at to secure the proper means of expelling water from the mines, quarries, etc. With this Pump an immense saving is effected in both instances, as in first cost it is much less than other Pumps of the same capacity and power.

Its principle is that of a Double-acting Force Pump, with a heavy double-acting piston cast in one piece, and a double-acting iron valve within the same, without the use of leather valves or any packing whatever.

DIRECTIONS FOR ADJUSTING PUMPS.

1st. Find the exact measurement of the well or cistern from the extreme bottom to the top or curb, after which make such an allowance as may be required, above the curb or top, as will accommodate the sized vessel required to be used, and in respect to the quantity of pipe required, always deducting for the length of the Pump and the space between the bottom and the Pump. 2d. Provide a plank, to which the Pump must be secured, not less than seven inches wide by two or two and a half inches thick, which should reach from the bottom to the top of the well or cistern, always placing the plank on the side of the well or cistern. 3d. Before putting the plank into a well or cistern, fit and bolt the Pump to the plank, and screw the pipe firmly in, taking care to have the Pump not less than one foot from the bottom of a well, nor less than six inches from the bottom of a cistern. Yet, if the water be six feet deep in a well, then adjust the Pump three feet from the bottom, and in like proportion as the case will permit, always being governed by the depth of water in the well, and always observing the necessity of securing the plank at the bottom of the curb, by braces across the well, and standing perfectly plumb and solid under the platform orcovering of the well, when the fulcrum can be fastened to the platform, taking care to give the pipe free action when in motion.